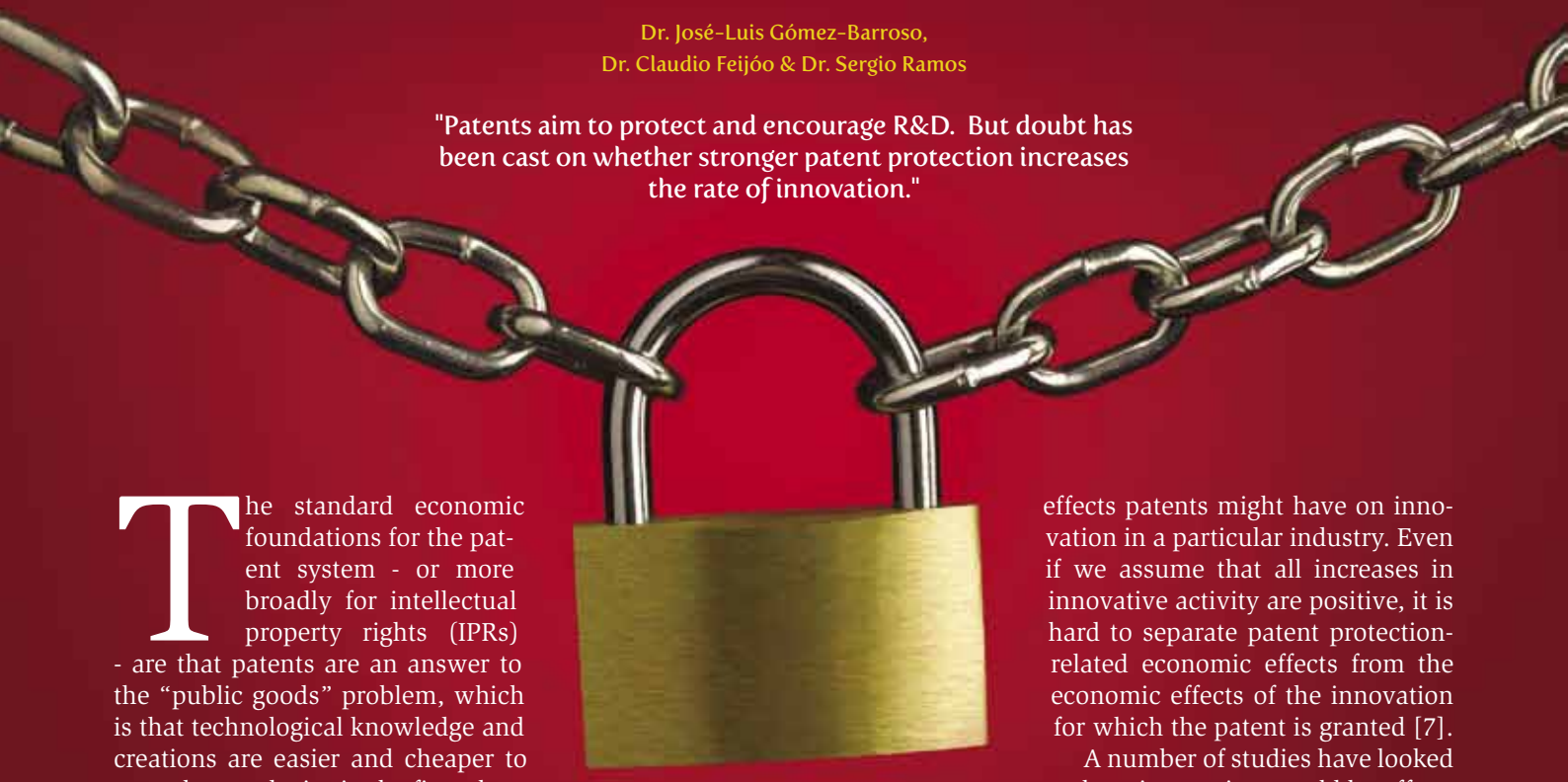
THE ROLE OF PATENTS
IN THE ADVENT OF WEB 2.0

Given the significant impact of Web 2.0-related innovations on new Internet-based initiatives, this paper seeks to identify to what extent the main developments are protected by patents and whether patents have had a leading role in the advent of Web 2.0. The article shows that the number of patent applications filed is not that important for many of the Web 2.0 technologies in frequent use and that, of those filed, those granted are even less. The conclusion is that patents do not seem to be a relevant factor in the development of the Web 2.0 (and more generally in dynamic markets) where there is a high degree of innovation and low entry barriers for newcomers.

Dr. José-Luis Gómez-Barroso,
Dr. Claudio Feijóo & Dr. Sergio Ramos

"Patents aim to protect and encourage R&D. But doubt has been cast on whether stronger patent protection increases the rate of innovation."



The standard economic foundations for the patent system - or more broadly for intellectual property rights (IPRs) - are that patents are an answer to the "public goods" problem, which is that technological knowledge and creations are easier and cheaper to copy than to devise in the first place. Patents in effect privatise the public goods thereby giving potential inventors an incentive to engage in research and development [1]. Patents are a price to be paid for innovative activity although they can have a negative "welfare" effect if applied too widely around the world [2].

This economic foundation for patents, however, has not been without criticism [3]. The arguments against it are reinforced when the effects of the duration of patent protection are considered. Winter [4] shows that the trade-off between the increase in innovation and the privatisation of a public good in theory might not even appear where there are very short-lived patents (or no patents at all).

The debate has intensified in recent years as a result of the explosion in the number of patents and the trend towards broadening the definition of patentable subject matter [5, 6] and is having an impact on the central debate regarding the appropriateness or validity of patents as a tool to promote innovation.

In order to settle the disagreements on these theories, attempts have been made to consolidate the arguments with practical studies. This is not an easy task. It is difficult to develop any specific understanding about the effects patents might have on innovation in a particular industry. Even if we assume that all increases in innovative activity are positive, it is hard to separate patent protection-related economic effects from the economic effects of the innovation for which the patent is granted [7].

A number of studies have looked at how innovation would be affected by a reform of the patent system (or, more generally, of IPRs). The results obtained cast some doubt on whether stronger patent protection increases the rate of innovation. Helpman [8] showed that strong patent protection will increase the rate of innovation only in the short term as it raises profitability; in the long term it lowers the innovation rate as the producers tend to produce the older products. Other studies [9, 10, 11] seem to agree with this idea. For industries where innovation is sequential and complementary (as in software, semiconductors and computers), Bessen and Maskin [12] conclude that stronger protection

would limit innovation and thereby inhibit technological change.

Apart from these, only a few studies actually address the heart of the problem and assess, not the eventual reforms to the system, but the actual validity and effectiveness of the patent system itself.

In this regard, Mansfield [13] and Levin et al [14] already reached the conclusion that, aside from pharmaceuticals, firms in most industries reported that patents were neither particularly effective, nor necessary, for enabling them to appropriate returns from their R&D.

More recently, Cohen et al [15] discovered that, in manufacturing industries, patents as a mechanism to profit by invention are of less emphasis whereas secrecy and lead-times tend to be emphasised most heavily. Arundel [16] confirms that secrecy is generally better appreciated by firms, regardless of their size.

Against this backdrop, this article seeks to contribute to this debate by assessing the past and present impact of the patent mechanism on the development of the so-called Web 2.0. A quantitative study has been conducted on the number of patents (applications filed and granted) related to the technologies that underlie the applications that can be considered characteristic of Web 2.0. The assessment of the data resulting from this study enable qualitative conclusions to be drawn on the role and influence of patents in the "redesigning of the web".

The topic is highly relevant for several reasons:

- The aforementioned lack of similar analysis.
- The role of the Web 2.0 as a spearhead of economic (and social) innovation in developing the information society.
- Software patents are the area that has generated the most controversy within the global debate on IPRs.
- Many of the most important innovations in the software industry in general, and of Web 2.0 in particular, come from relatively small firms. (A significant limitation of most of the studies reported above is that they typically focussed on large firms with an established presence in their product markets and with access to the various assets needed to commercialise the end-product of their innovative efforts.)

The article is organised as follows. First, a brief description is provided on what is understood as Web 2.0. Next, three scenarios are identified regarding the use and impact of patents in the development of Web 2.0. This is followed by an analysis of the number of patents related to Web 2.0, highlighting some specific aspects such as the separation between patent applications filed and and those granted and the world region where the patent application has been filed. Using this data, conclusions are reached as to which of the scenarios seems to predominate.

THE WEB 2.0 CONCEPT

Web 2.0 challenges the status quo of the software, Internet and communications industries in terms of technologies and also business models. Examples abound and involve the big players from within the Internet arena as well as emerging new players. All these players continue to invest in new applications either through internal development or through acquisitions.

Although the term Web 2.0 suggests a new version of the World Wide Web, it does not refer to an update to any technical specifications. In fact, many of the technological components of Web 2.0 have existed since the early days of the web; it is their combined use that makes the difference.

"Web 2.0 challenges the status quo of the software, Internet and communications industries in terms of technologies and also business models."

Web 2.0 embraces a complex and continually evolving technology set consisting mainly of server-software, content-syndication, messaging-protocols, standards-oriented browsers with plug-ins and extensions, and various client-applications (see Figure 1). The complementary approaches of such elements provide Web 2.0 sites with information-storage, creation, and dissemination capabilities way beyond the environment of Web 1.0.

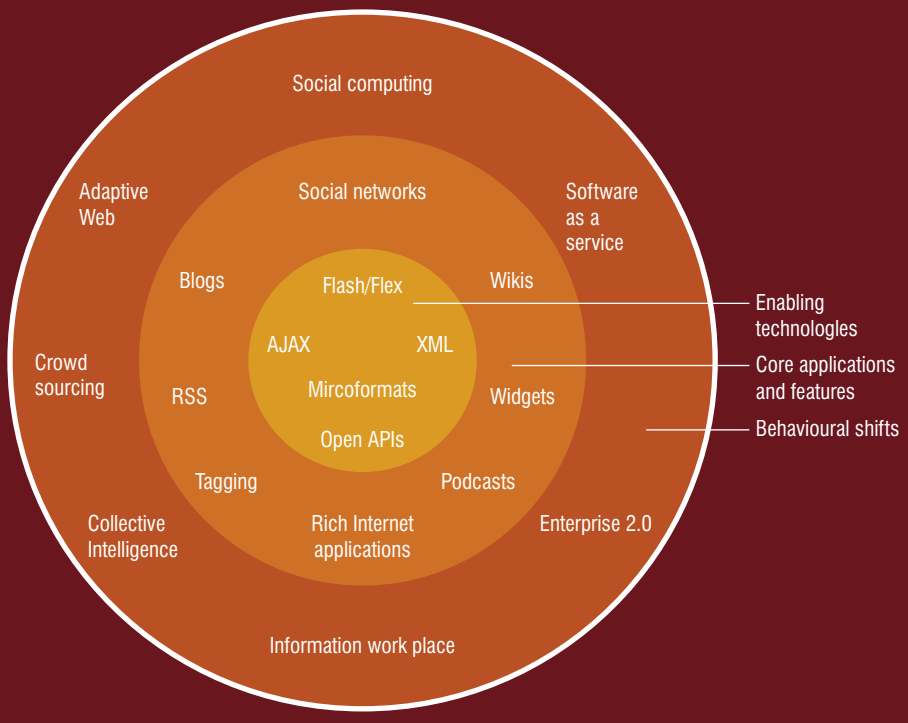
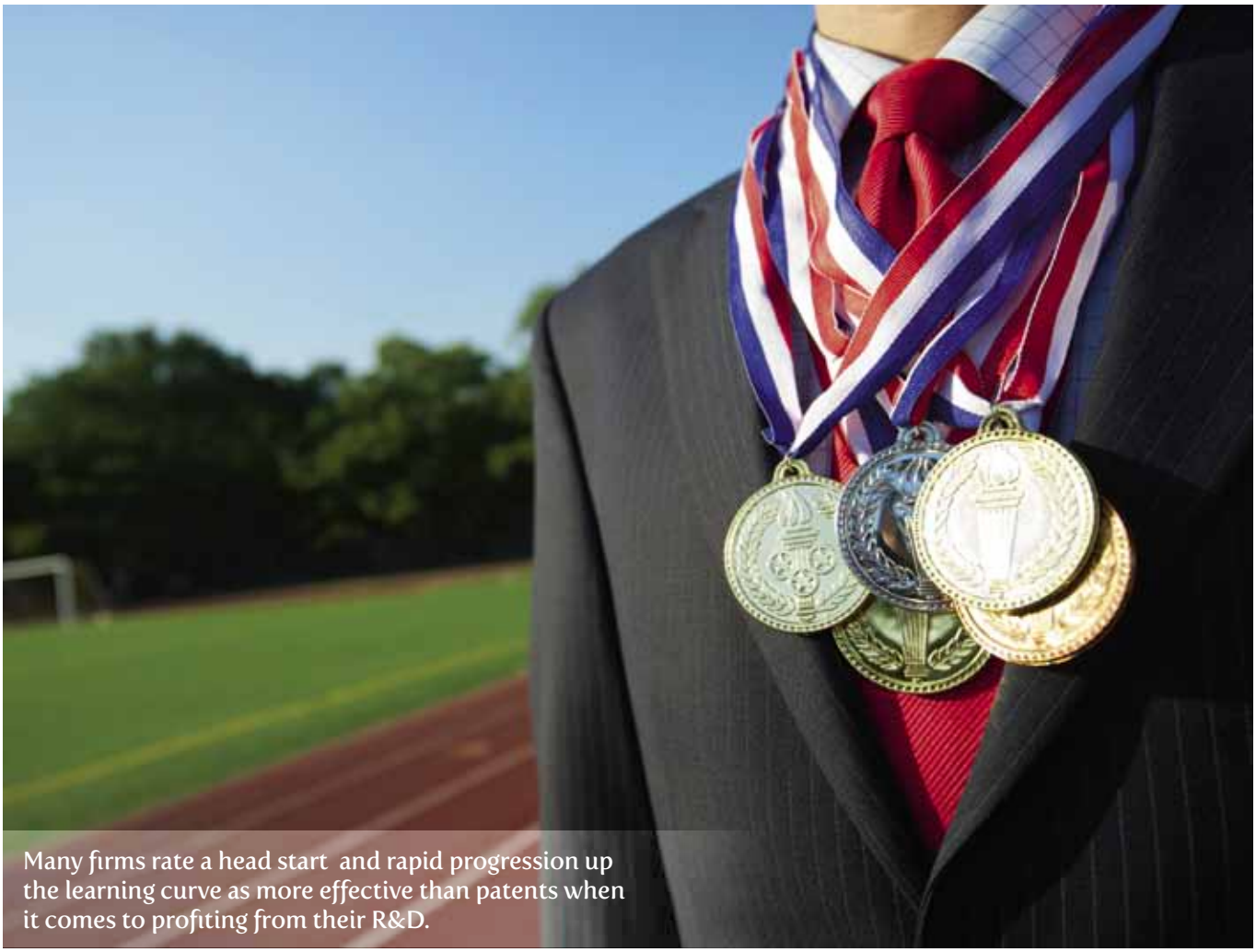


Figure 1: *The "three lenses" of Web 2.0; source: Koplowitz and Young [17].*



Many firms rate a head start and rapid progression up the learning curve as more effective than patents when it comes to profiting from their R&D.

ROLE OF PATENTS IN WEB 2.0 INNOVATION – POSSIBLE SCENARIOS

At the start of the evolution to Web 2.0, it seemed that the role of patents could be decisive. Shulman [18] noted that "broad patents on software-enabled businesses are fast becoming commonplace". Now, several years on, has this trend been confirmed (or consolidated)? What is the role of patents as regards the innovations described in the previous section? Is it an option to which application developers frequently resort, or do these applications reach the market without the existence of patents or at least without the affected patents being significant?

The answers to these questions can be classified to generate three scenarios:

- ***Scenario 1:*** Patents are an option that is used and their impact is significant. In this case, the number of granted patents would be high. Undoubtedly, the patent rights would be leveraged by their holders, rights that (at least theoretically) could be brandished in front of application developers trying to use the patented resources.
- ***Scenario 2:*** Patents are an option that is used but their impact is not significant. In this scenario, the number of patent applications would be high, although the number of those granted would be low. This would mean that, on the one hand, companies continue to try to protect their eventual intellectual property rights through the patent system but, on the other hand, patents are not important (at least not yet) in the development of the current Web 2.0.
- ***Scenario 3:*** Patents are an option that is seldom used. The number of patent applications is low. The Web 2.0 is growing without patents playing any role today or in the future.

We carried out a study, as described in the next section, to try to determine which of these scenarios is closest to reality.

ANALYSIS OF WEB TECHNOLOGIES RELATED TO PATENTS

Methodology

Technologies regarded as the most important underlying the development of services and applications characteristic of Web 2.0 were identified and grouped into the following categories:

- Rich Internet Applications.
- Asynchronous Javascript and XML (AJAX) technologies.
- Microformats.
- Really Simple Syndication, Rich Site Summary.
- Simple Object Access Protocol (SOAP)[1].
- eXtensible Access Control Markup Language (XACML)[2].
- Application Programme Interfaces.
- Peer-to-Peer (P2P)[3] distribution.

These technologies were used as search terms in the Derwent World Patents Index® database (see thomsonreuters.com/products_services/legal/legal_products/a-z/derwent_world_patents_index/). We collected

and classified patents from 2000 to 2006. No patent applications prior to 2000 could really be considered Web 2.0-related. On the other hand, by 2006 almost every Web 2.0-type of application was already present in the market. Since 2006, whilst the number of Web 2-0 applications has grown, they have not changed radically.

Results

Table 1 provides some interesting initial conclusions. Globally, patent applications have not been keeping up with the pace at which Web 2.0-type services and applications have been emerging and become widely used. Their number stagnated during the period 2004-2006, a fact that contrasts with the reality of market where the number of new developments and applications was increasing significantly.

Moreover, if we remove the terms "P2P" and "Extensible Markup Language[4] (XML)" from the global figures, the number of remaining patents decreases dramatically. Furthermore, there are many specific technologies with less than 10 patent applications and many others simply without any - JSON[5], Microformats, Atom[6], XACML, REST (Representational State Transfer).

> "The number of technology-related patents supporting Web 2.0 seems to be, up to now, barely significant."

Table 2 identifies the offices where patent applications were filed. The United States Patent and Trademark Office (USPTO) accounts for over 40% of applications. Also widely used were the offices of the World Intellectual Property Organization (WIPO) and the European Patent Office (EPO).

Table 2 also shows the significant disparity between patents issued (applied for) and granted. In European countries (including the EPO, although with the exception of the United Kingdom) and also in the WIPO, the percentage of successful patent applications is extraordinarily low. On the other hand, the patent offices of Korea, Taiwan, Australia and United Kingdom granted over 50% of patents. In the USA, the figure is slightly over 40%.

Figure 2 shows that the applications filed in the United States tend to be more globally oriented as many are later filed in other offices. Generally speaking, this is also the case of those filed in European countries or

		2000	2001	2002	2003	2004	2005	2006	TOTAL
RIA	RIA (Rich Internet Applications)	0	0	2	3	2	0	1	8
	Asynchronous Javascript	0	0	0	0	0	0	1	1
	Macromedia, Adobe Flash	1	1	1	4	6	7	4	24
	Macromedia, Adobe Flex	0	0	0	0	0	0	0	0
	OpenLaszlo[7] (Open Source)	0	0	0	0	0	0	0	0
	Silverlight (Microsoft)	0	0	0	0	0	0	0	0
	JavaFxScript (Sun Micr.)	0	0	0	0	0	0	0	0
	TOTAL	1	1	3	7	8	7	6	33
AJAX (Asynchronous Javascript and XML)	XML (Extensible Markup Language)	116	271	435	642	748	804	787	3803
	CSS (Cascading Style Sheet)	20	23	27	31	34	37	22	194
	DOM (Document Object Model)	4	4	12	32	33	21	36	142
	Javascript[8]	4	7	21	27	18	37	25	139
	XHTML[9] (Extensible Hypertext Markup Language)	2	8	20	18	40	16	0	104
	Jscript	0	0	2	0	3	2	3	10
	ECMAScript	0	0	1	1	1	0	0	3
	JSON (JavaScript Object Notation)	0	0	0	0	0	0	0	0
	TOTAL	146	313	518	751	877	917	873	4395
Microformats		0	0	0	0	0	0	0	0
RSS	RSS (Really Simple Syndication, Rich Site Summary)	0	0	0	0	0	1	7	8
	Atom	0	0	0	0	0	0	0	0
SOAP (Simple Object Access Protocol)		0	0	6	23	50	57	49	185
XACML (eXtensible Access Control Markup Language)		0	0	0	0	0	0	0	0
APIs	Web Services APIs (Application Programme Interfaces)	1	1	5	3	3	7	4	24
	REST (Representational State Transfer)	0	0	0	0	0	0	0	0
P2P (Peer-to-Peer)		54	118	216	415	457	631	572	2463
TOTAL		**202**	**433**	**748**	**1199**	**1395**	**1620**	**1511**	**7108**
TOTAL – P2P		148	315	532	784	938	989	939	4645
TOTAL – P2P – XML		32	44	97	142	190	185	152	842

Table 1: *Number of patent applications from 2000 to 2006 for each of the Web 2.0 underlying technologies*

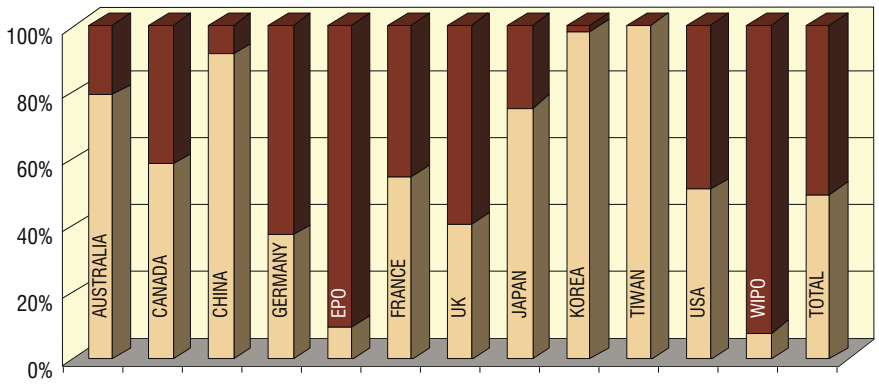
	Total (2000-2006)			Total – P2P (2000-2006)			Total – P2P – XML (2000-2006)		
	Issued	Granted	Total	Issued	Granted	Total	Issued	Granted	Total
Australia	13	7	20	11	5	16	4	0	4
Canada	30	2	32	22	1	23	2	0	2
China	119	28	147	89	26	115	9	6	15
Germany	52	9	61	32	6	38	7	2	9
France	66	0	66	50	0	50	9	0	9
Hungary	1	0	1	1	0	1	0	0	0
Japan	935	76	1011	742	63	805	140	7	147
Korea	311	169	480	253	143	396	63	29	92
Taiwan	13	9	22	12	7	19	2	2	4
United Kingdom	67	32	99	49	13	62	4	3	7
USA	2396	984	3380	1447	572	2019	254	102	356
EPO	442	16	458	276	4	280	44	2	46
WIPO	1223	15	1238	737	1	738	128	1	129
Research[10] Disclosure	93	0	93	83	0	83	22	0	22
TOTAL	**5761**	**1347**	**7108**	**3804**	**841**	**4645**	**688**	**154**	**842**

Table 2: *Patent applications filed / granted by geographic area*

Web 2.0 technologies

Applications filed in one office
Applications filed in more than one office

Source: Own elaboration



Web 2.0 technologies - P2P - XML

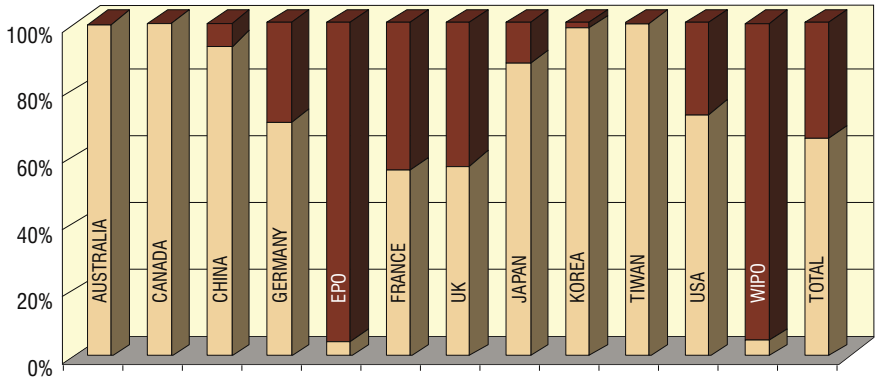


Figure 2: Diffusion of patents (percentage one office / more than one office)

> "Successful innovations are extremely varied in Web 2.0 markets. The dynamism of these markets opens up opportunities to innovate that are very hard to find in other industries."

at the EPO. However, this is not the case in the Asian offices. It would be interesting to know to what degree linguistic or cultural issues can influence the fact that Asian country developers seem to focus their efforts on their own markets as opposed to the global ambition (at least as regards patents) of the Europeans and Americans.

Obviously, the figures presented must be put into context in order to reach a conclusion about their importance. There are no patent classes for software per se. Therefore, how many software patents exist depends in part on how one defines a software patent. Using a method identical to the one described above, Bessen and Hunt [19] used a series of search terms ("software" or "computer and program") in the databases and found that over 20,000 software patents were granted each year in the USPTO, comprising about 15% of all patents.

We searched the EPO and WIPO databases using the Bessen and Hunt search terms. The results suggest that, during the 2000 to 2006 period, the number of software-related patents filed were:

- 4044 at EPO (compared to 458 using Web 2.0 technology search terms, 11.3%; 1.1% leaving aside P2P and XML).
- 6863 at WIPO (compared to 1238 using Web 2.0 technology search terms, 18%; 1.8% leaving aside P2P and XML).

Innovation exists regardless of (or despite) the patent applications filed

In both cases, the trend over the 2003 to 2006 period is clearly upward: 245 – 476 – 1322 - 1601 software-related patents filed at EPO; 340-710-2417-2750 at WIPO. This fact strikingly contrasts with the stagnation shown in our analysis of Web 2.0 technologies - precisely the period when Web 2.0 applications start flourishing.

Despite the imprecisions presented by the calculations for obtaining the total number of existing software patents, the truth is that the difference in magnitudes between software-related patents and those obtained by us specifically for Web 2.0 technologies is sufficiently important to reach a convincing conclusion: the number of technology-related patents supporting Web 2.0 seems to be, up to now, barely significant.

AUTHORS' CONCLUSIONS

If we compare these results with the the three scenarios proposed earlier, the conclusion is that we are in "Scenario 2.5". Indeed, this is an intermediate situation since it cannot be said that patents are a resource that is not used (Scenario 3) but, given the results, neither can it be said that patent applications are being filed intensively (Scenario 2).

What can be said (and is a feature common to Scenarios 2 and 3) is that the impact of patent application filing does not affect significantly the development of the markets. Indeed, with Web 2.0, we see daily the introduction of new functions and features. Innovation exists regardless of (or despite) the patent applications filed. How can this situation be explained?

Classical IPRs are only one of the mechanisms that companies use to protect their innovative activities [20, 21]. There are other mechanisms for appropriating the value of innovation such as: secrecy, labour contracts, lead-time advantages, costs and time required for duplication, customer relation management, exclusive contracts with suppliers and even "technological" aspects (a complex product design or the embodiment of intangibles in their products).

In the case of technological sectors, Mazzoleni and Nelson [22] conclude that, in a wide range of "high-tech" industries, firms rated a head start, establishment of effective production, sales and service facilities, and rapid progression up the learning curve, as much more effective than patents in enabling them to profit from their R&D. And focusing on software-related activities, Allison et al [23] refer to the "limited value that patents have for appropriating the value of a software innovation".

If a broader perspective is taken, however, the protection mechanisms are only one of many institutional and technological conditions that affect profitability and competitive success of innovators themselves.

Teece [24] argued that profits from innovation depend on the interaction of three families of factors, namely; regimes for appropriating the value (largely dictated by the nature of technological knowledge), complementary assets, and the presence or absence of a dominant paradigm. How these factors influence the link between (un)successful knowledge accumulation and market exploitation differs greatly between technology fields or sectors [25].

The markets of Web 2.0 show peculiar characteristics (global network externalities; marketing one-to-one; in many occasions, free service, and a source of indirect income) that probably reduce the number of mechanisms for appropriating the value required for successful innovation.

Exploring this idea further, successful innovations are extremely varied in Web 2.0 markets. The dynamism of these markets opens up opportunities to innovate that are very hard to find in other industries. This confirms the opinion of Dosi el al [3] for whom the rates of innovation fundamentally depend on paradigm-specific opportunities rather than on merely the conditions for appropriating the value (at least above a specific threshold) and even less so on the specific subset of appropriating mechanisms represented by IPR protection.

Also Dosi et al [3] provide an answer to the fact that, often very similar innovations, applied to services or applications that can be classified as pertaining to the Web 2.0, provide disparate results. Thus, they conclude that, although the first order determinants of the rates of innovation are born out of the technology-specific and sector-specific opportunity conditions,

AUTHORS' CONCLUSIONS

the differential ability of individual firms to economically benefit from them stem from idiosyncratic organisational capabilities.

Interestingly, it has been pointed out that a great deal of the innovation in Web 2.0 depends on small firms. According to Allison et al [23], although patents provide little benefit to an early-stage pre-revenue start-up firm, they become increasingly important as the firm matures and begins to develop revenue streams. This is because the motives for patenting go beyond simply protecting one's own technology. Patents can be used in an offensive as well as a defensive way, aiming more at hindering competitors than protecting one's own inventions. In fact, extensive portfolios of legal rights are considered a means for entry deterrence ("strategic patenting") [26]. Additionally, patents have acquired strategic value as means to signal the enterprise's value to potential investors or improve technological image [27]. Even, sometimes, the application for a patent appears to matter more than its grant [28].

We should qualify these general statements with the specific conditions of the sector, however. Best practices to manage innovation vary by time-to-market [29]. Moreover, in the specific case of ICT-related markets, Dosi et al [3] suggest that strong IPRs did not play a pivotal role either in the emergence of ICT or as a means of value generation. In the early stage of those sectors, it might have been the very weakness of the patent regime that spurred their rapid growth, whereas the strengthening of the IPR regime in recent years might well have been a consequence, rather than a cause, of the fast pace at which the ICT sector expanded.

Therefore, we conclude that the role of patents does not seem to be truly relevant in Web 2.0 markets. This conclusion could be extended to dynamic markets, with many participating agents, a high degree of innovations appearing and small entry barriers (as well as short lead times) separating them from the consumer. However, this conclusion must not be extended to markets with other characteristics: mature markets, with a restricted competition or where the arrival of the product in the market requires a production process where the role of standards is more important.

ABBREVIATIONS

AJAX	Asynchronous JavaScript And XML	USPTO	United States Patent and Trademark Office
EPO	European Patent Office	WIPO	World Intellectual Property Organization
IPR	Intellectual Property Right	XACML	eXtensible Access Control Markup Language
JSON	Javascript Object Notation	XML	Extensible Markup Language
P2P	Peer-to-Peer		

FOOTNOTES

[1] SOAP describes a model for packing Extensible Markup Language (XML) enquiries and responses. SOAP messaging is used to enable exchange of a variety of XML information between server and client computers.

[2] XACML is a declarative access control policy language implemented in XML and a processing model, describing how to interpret the policies.

[3] P2P is a form of file sharing where users trade files with each other, versus downloading them from a centralized server. Peer-to-peer networking employs a system in which each user can see the files that every other connected user has to share.

[4] XML is an open standard for exchanging structured documents and data over the Internet that was introduced by the World Wide Web Consortium (W3C) in November 1996.

[5] JSON (Javascript Object Notation) is used for data interchange between programs, an area in which the ubiquitous XML is not too well-suited. JSON is lightweight and works extremely cleanly with languages languages including JavaScript, Python, Java, C + + , and many others.

[6] Atom is the name applied to a pair of related standards. The Atom Syndication Format is an XML language used for web feeds, while the Atom Publishing Protocol (referred to as "AtomPub" for short) is a simple HTTP-based protocol for creating and updating Web resources.

[7] OpenLaszlo is an open source platform for the development and delivery of web applications with a usable human interface.

[8] Javascript is a scripting language produced by Netscape for use within HTML Web pages.

[9] XHTML has the same depth of expression as HTML, but also conforms to XML syntax.

[10] Research Disclosure is an international publication service that allows researchers and inventors to establish an invention as Prior Art, preventing others from patenting the idea.

References

1. Lemley, M.A. 2002. Intellectual property rights and standard-setting organizations. California Law Review 90(6): 1889-1980
2. Deardorff, A. 1992. Welfare effects of global patent protection. Economica 59(233): 35-51
3. Dosi, G., Marengo, L., and Pasquali, C. 2006. How much should society fuel the greed of innovators? On the relations between appropriability, opportunities and rates of innovation. Research Policy 35(8): 1110-1121
4. Winter, S.G. 1993. Patents and welfare in an evolutionary model. Industrial and Corporate Change 2(1): 211-231
5. Hall, B.H. 2005. Exploring the patent explosion. Journal of Technology Transfer 30(1-2): 35-48
6. Kortum, S., and Lerner, J. 1998. Stronger protection or technological revolution: what is behind the recent surge in patenting? Rochester Conference Series on Public Policy 48: 247–307.
7. Mann, R.J. 2005. Do patents facilitate financing in the software industry? Texas Law Review 83(4): 961-1030.
8. Helpman, E. 1993. Innovation, imitation and intellectual property rights. Econometrica 61(6): 1247-1280
9. McCalman, P. 2005. International diffusion and intellectual property rights: An empirical analysis. Journal of International Economics 67(2): 353-372
10. Branstetter, L.G. 2004. Do stronger patents induce more local innovation? Journal of International Economic Law 7(2): 359-370
11. Sakakibara, M., and Branstetter, L. 2001. Do stronger patents induce more innovation? Evidence from the 1988 Japanese patent law reforms. Rand Journal of Economics 32(1): 77-100
12. Bessen, J., and Maskin, E. 2009. Sequential innovation, patents, and imitation. Rand Journal of Economics 40(4): 611-635
13. Mansfield, E. 1986. Patents and innovation: an empirical study. Management Science 32(2): 173-181
14. Levin, R.C., Klevorick, A.K., Nelson, R.R., and Winter, S.G. 1987. Appropriating the returns from industrial research and development. Brookings Papers on Economic Activity 1987(3): 783–820
15. Cohen, W., Nelson, R.R., and Walsh, J.P. 2000. Protecting their intellectual assets: Appropriability conditions and why U.S. manufacturing firms patent or not. NBER National Bureau of Economic Research Working paper 7552. Washington. Available at www.nber.org/papers/W7552.pdf
16. Arundel, A. 2001. The relative effectiveness of patents and secrecy for appropriation. Research Policy 30(4): 611-624.
17. Koplowitz, R., and Young, O.G. 2007. Web 2.0 social computing dresses up for business. Cambridge: Forrester Research report.
18. Shulman, S. 2000. Software patents tangle the Web. Technology Review 103(2): 68-76.
19. Bessen, J., and Hunt, R. 2004. An empirical look at software patents. Federal Reserve Bank of Philadelphia Working Paper 03-17/R. Philadelphia. Available at www.researchoninnovation.org/swpat.pdf
20. Galende, J. 2006. The appropriation of the results of innovative activity. International Journal of Technology Management 35(1-4): 107-135
21. Hurmelinna-Laukkanen, P. 2009. The availability, strength and efficiency of appropriability mechanisms - protecting investments in knowledge creation. International Journal of Technology Management 45(3-4): 282-290
22. Mazzoleni, R., and Nelson, R.R. 1998. The benefits and costs of strong patent protection: a contribution to the current debate. Research Policy 27(3): 273-284.23
23. Allison, J.R., Dunn, A., and Mann, R.J. 2007. Software patents, incumbents, and entry. Texas Law Review 85(7): 1579-1625
24. Teece, D. 1986. Profiting from technological innovation: implications for integration, collaboration, licensing and public policy. Research Policy 15(6): 285-305
25. Bekkers, R., Duysters, G., and Verspagen, B. 2002. Intellectual property rights, strategic technology agreements and market structure – The case of GSM. Research Policy 31(7): 1141-1161
26. Artz, K.W., Norman P.M., Hatfield D.E., and Cardinal L.B. 2009. A longitudinal study of the impact of R&D, patents, and product innovation on firm performance. Journal of Product Innovation Management 27(5): 725-740
27. Hall, B.H., and MacGarvie, M.J. 2010. The private value of software patents. Research Policy 39(7): 994-1009
28. Cockburn, I.M., and MacGarvie, M.J. 2009. Patents, thickets and the financing of early-stage firms: Evidence from the software industry. Journal of Economics & Management Strategy 18(3): 729-773
29. Germeraad, P. 2010. Integration of intellectual property strategy with innovation strategy. Research-Technology Management 53(3): 10-18

ABOUT THE AUTHORS

DR GÓMEZ-BARROSO

Dr. José Luis Gómez-Barroso is an Associate Professor in the Department of Applied Economics and Economic History at UNED – Universidad Nacional de Educación a Distancia (Spanish National University of Distance Education). He has participated in different research projects, some of them for the European Commission, and published more than 40 academic papers. He is a member of the Management Committee of the European Science Foundation-funded COST 605 Action (Econ@Tel – A Telecommunications Economics COST Network) and serves as a member of the editorial committee of Telecommunications Policy.

DR CLAUDIO FEIJÓO

Dr. Claudio Feijóo holds a MSc and PhD in Telecommunication Engineering and a MSc in Economics. Currently he is professor at the Technical University of Madrid (UPM) where he researches the future socio-economic impact of emerging information society technologies, in particular, from a next generation networks, mobile and/or content perspective. He serves as Deputy Director at the Research Centre for Applied ICTs (CeDInt) at UPM. He enjoyed his two years at the Institute for Prospective Technological Studies of the European Commission, and participated in the information society development plans and broadband deployment strategies while being adviser for the Spanish State Secretary on Telecommunications and Information Society. For three years he was also dedicated to launching a university spin-off devoted to the transfer of know-how in technology, media and telecommunications. He has been involved in numerous research, development and consulting projects, both public and private, in Spain, Europe, Latin America and North of Africa. He is particularly proud of the project for electronic communication sector development he conducted for the EU in Latvia. He lectures regularly in seminars and postgraduate courses and has authored many publications.

DR SERGIO RAMOS

Dr. Sergio Ramos, gained his PhD and Masters in Telecommunications Engineering from the Universidad Politécnica de Madrid. He holds an MBA from the Stockholm School of Economics and a degree in Advanced Management from the IE Business School. He worked for the European Commission as Resident Twinning Adviser of an EC Twinning Project for the Public Utilities Commission of Latvia, to design and monitor the transposition process of EU electronic communications regulatory framework into Latvian legislation. He is currently the Innovation and Entrepreneurship Manager at CeDInt-UPM. In addition he is Partner and Managing Director of Noon Venture, an international consulting firm on ICT sector public policies, regulation and business strategies. He was former Deputy General Director at the Spanish Association of Telecommunication Network Operators REDTEL.

NB: The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of their Institutions

Call for Papers

Authors are encouraged to submit articles for publication in The Journal.
Interested parties should e-mail journal@theITP.org in the first instance with topic suggestions.